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SERVICE MANUAL

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1TL200 BLAK & BK12 ODYSSEY GAME SIMULATOR

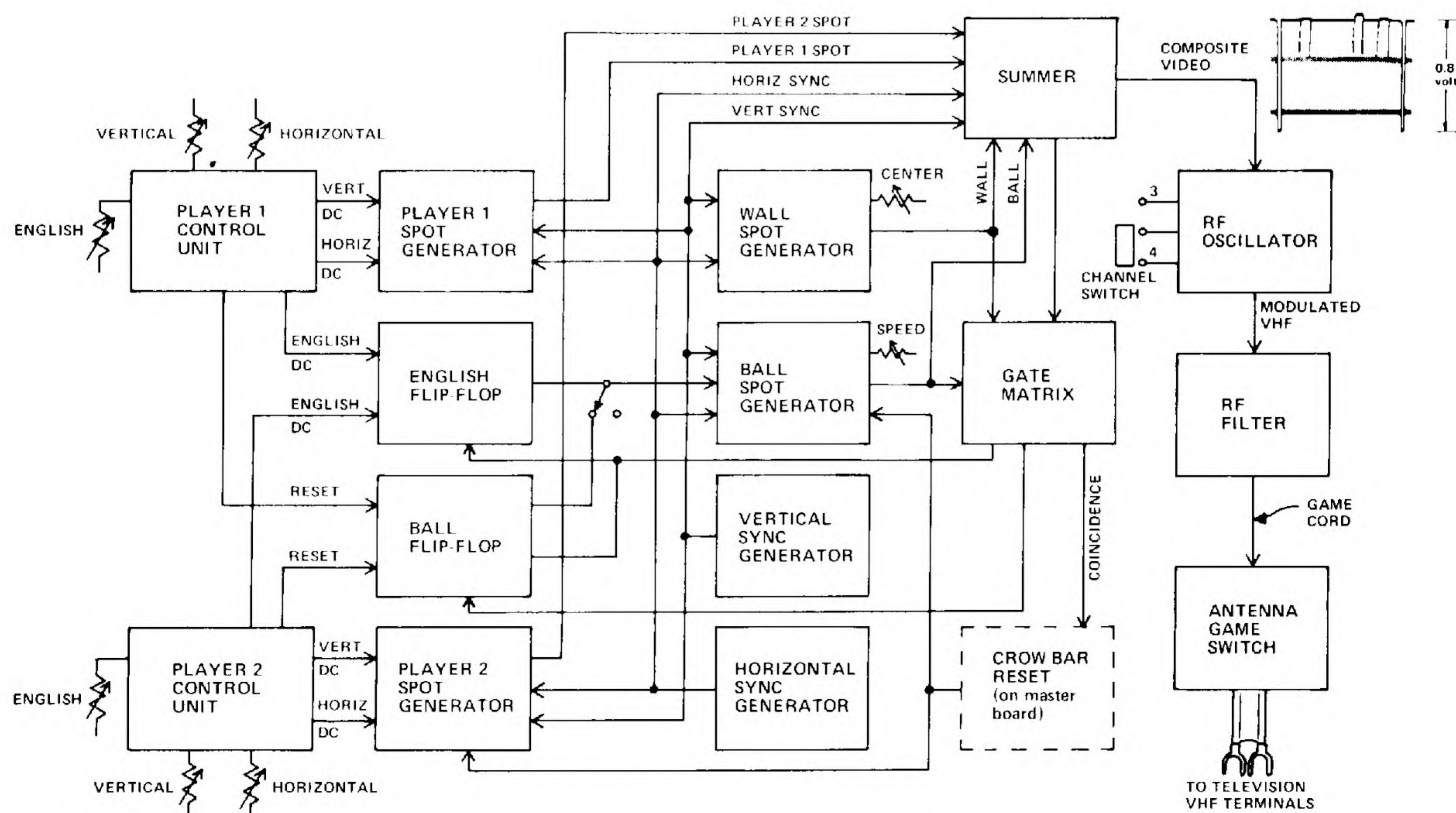
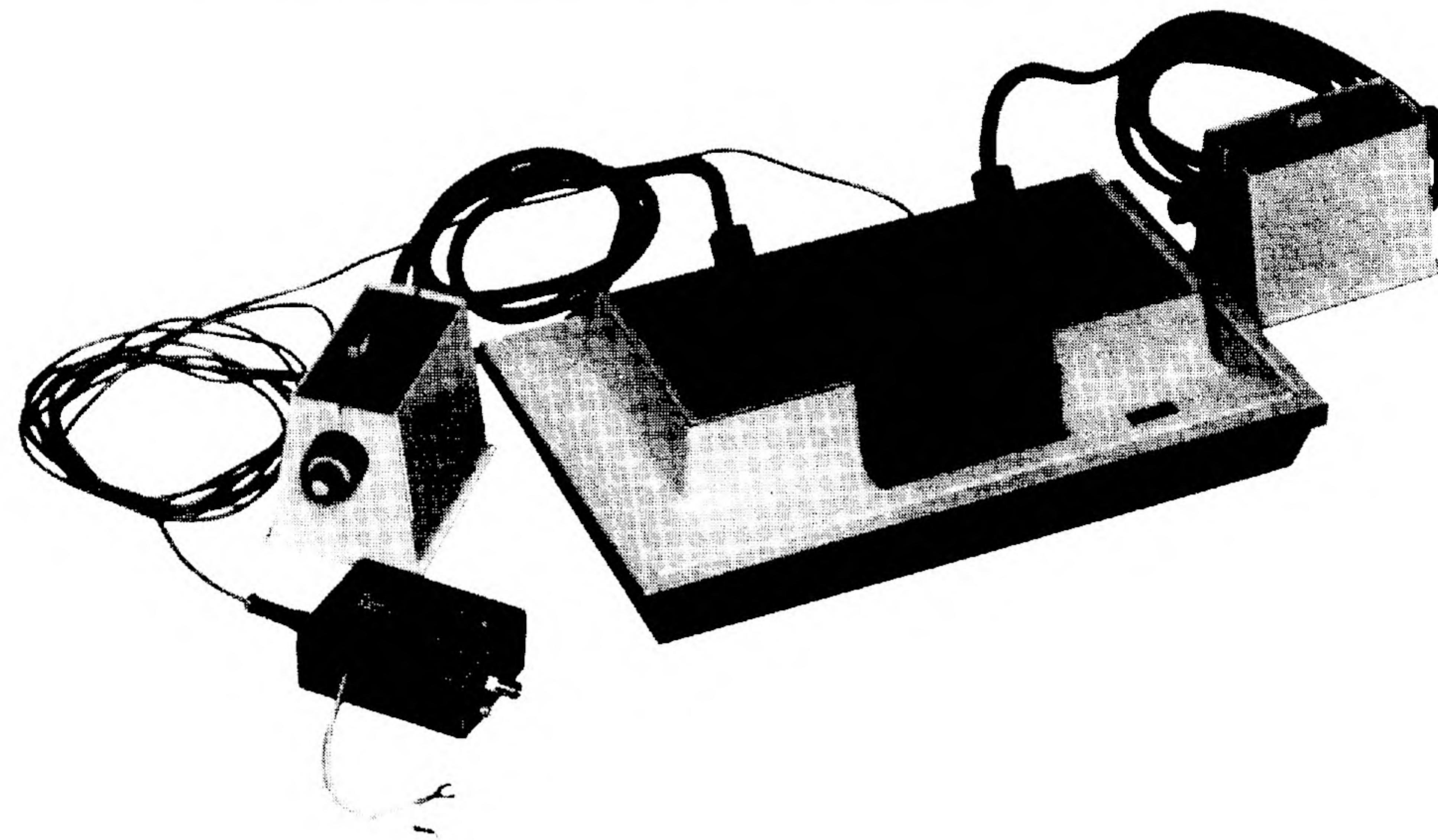


Figure 1 -- Odyssey Block Diagram

GENERAL DESCRIPTION

Odyssey is an electronic game simulator developed by Magnavox as a consumer leisure time product. The basic Odyssey set consists of a Master Control Unit, Game Cards, two Player Control Units, Antenna-Game Switch Box and the cables necessary to interconnect the electronics. Also included are game Overlays, Instruction Book, Poker Chips, etc., for playing the various games. Accessories such as the Rifle are available as options.

The Master Control Unit consists of a master board and 12 solid-state plug-in modules. Figure 1 is the block diagram of the Odyssey system excluding the television set.

The Odyssey game is connected as shown in Figure 2. The Master Control Unit generates the video, sync and RF signals necessary to produce two Players, a Ball and a Wall on the television screen.

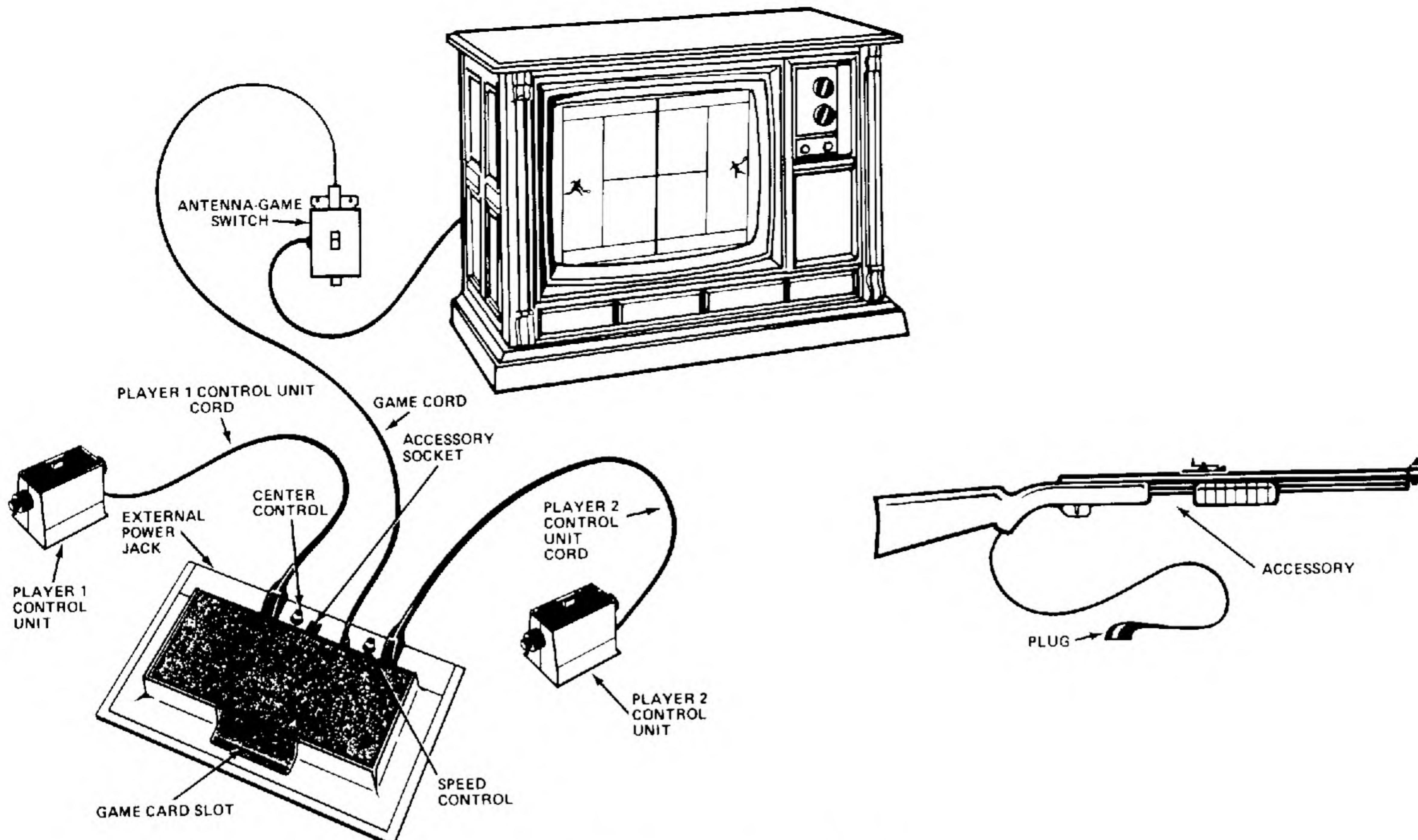


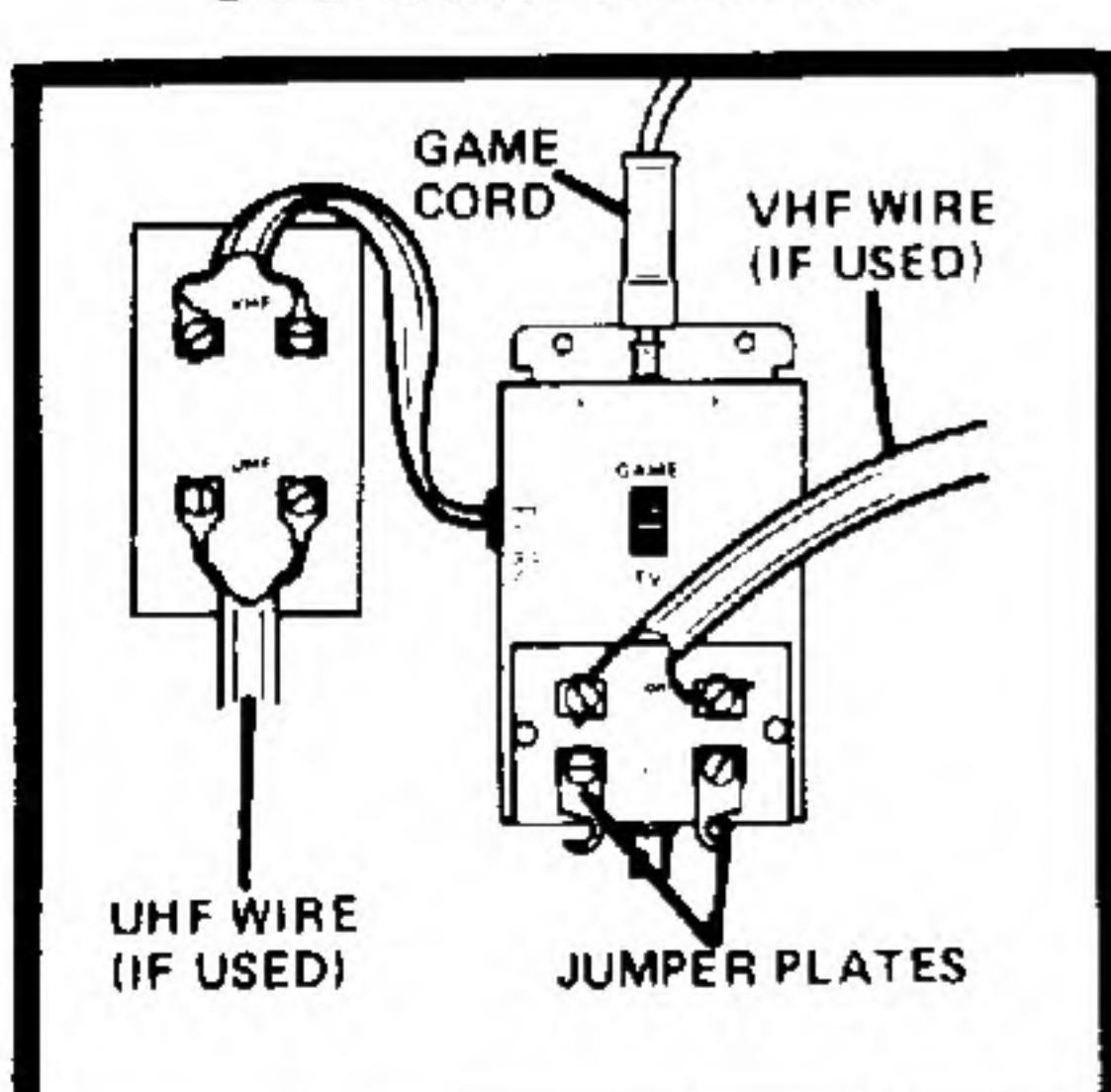
Figure 2 -- Odyssey Game Setup with Rifle Accessory

INSTALLATION INSTRUCTIONS

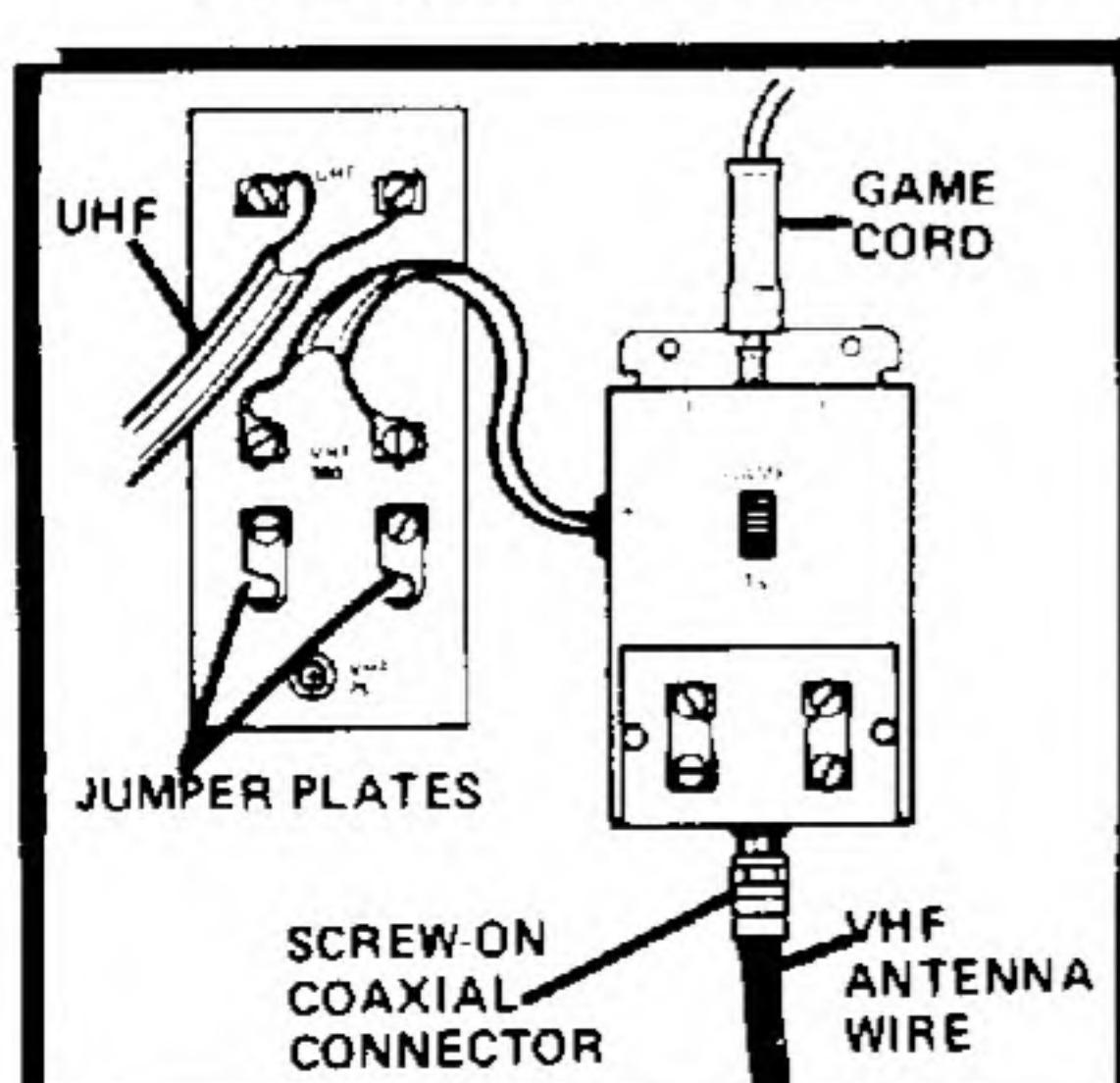
1. Plug the Player Control Unit cables into the Master Control Unit as illustrated in Figure 2. The two Player Control Units are identical; however, the Player Control Unit connected to the PLAYER 1 socket will be called Player Control Unit Number 1 and the one connected to the PLAYER 2 socket will be called Player Control Unit Number 2.
2. The GAME CORD is used to connect the Master Control Unit to the ANTENNA-GAME SWITCH. Insert one end of the GAME CORD into the socket marked GAME CORD on the Master Control Unit. The other end plugs into the socket on the top of the ANTENNA-GAME SWITCH marked GAME CORD.
3. The ANTENNA-GAME SWITCH is provided as a convenience to allow selection of either ODYSSEY or regular television viewing, without having to disturb antenna connections. After its initial installation, merely move the slide switch to either the GAME position for ODYSSEY . . . or to the TV position for television viewing.

Locate the VHF antenna terminals on the back of the television. Disconnect the VHF antenna cable (if there is one), and connect it to the ANTENNA-GAME SWITCH, as shown in the illustration. Connect the lead from the ANTENNA-GAME SWITCH to the VHF-300 terminals. When changing from GAME to TV, make certain the slide switch is moved to the extreme position; do not leave it in the middle.

300 Ohm Lead-In



75 Ohm Coax Lead-In

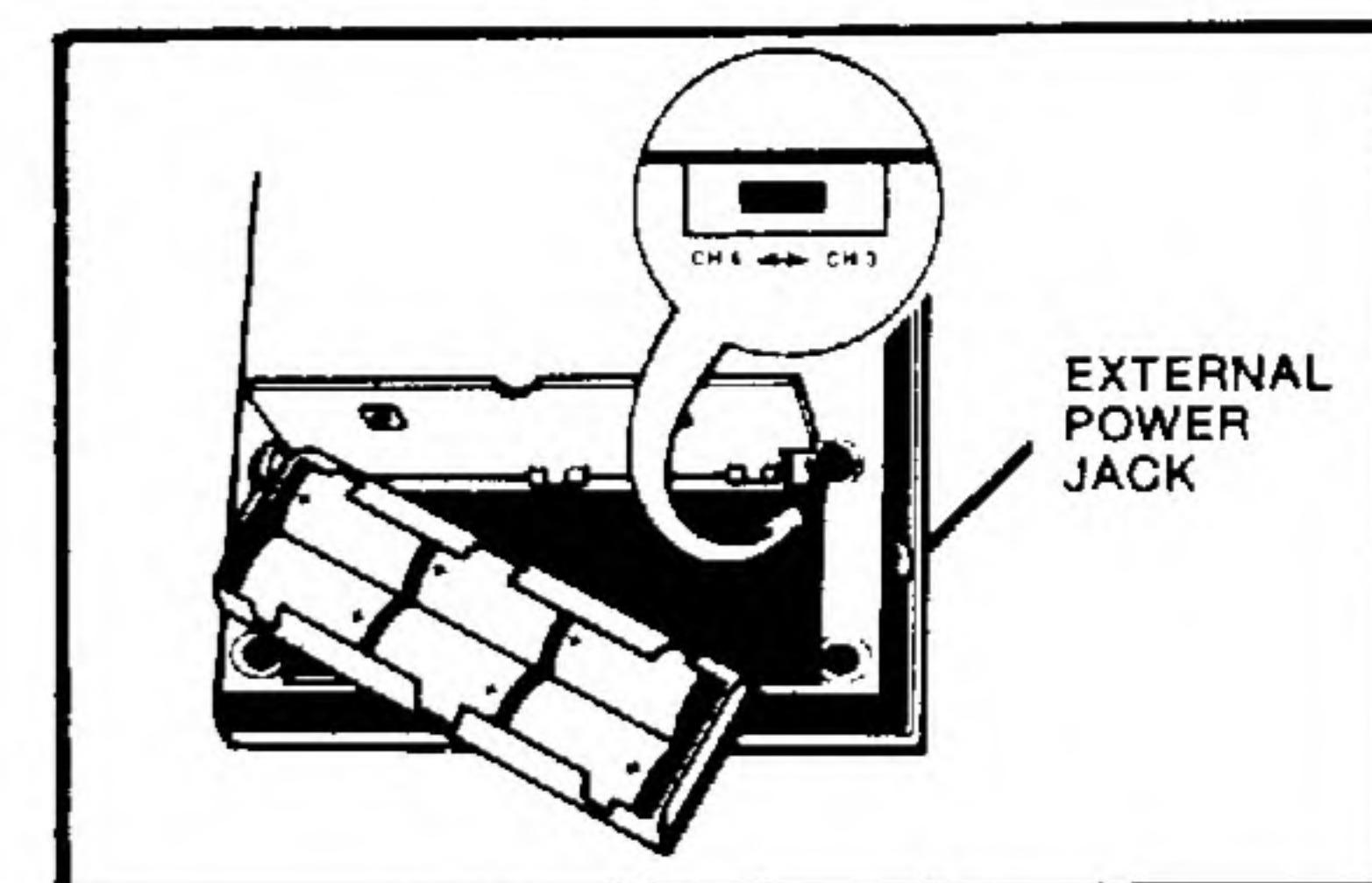


701517-1 "ANTENNA GAME SWITCH BOX" REPLACEMENT PARTS LIST

REF.	DESCRIPTION	PART NO.
	Strain Relief Bushing Plastic Hock (2 used)	102635-3 142712-1
	Antenna Connector, Male Coax	180739-1
	Antenna Connector, Female Coax	180902-3
	Antenna Switch Box	731913-5
	Antenna Switch Cover	731914-2
	TV/Game Switch	160499-1
S1	Balun	361000-8
T1		
T2	Balun	361485-1

CHECKOUT PROCEDURE

1. Visually inspect Master Control Unit, Player Control Units, and cables for breakage, cracks, broken or bent connector pins, broken wires, foreign material, corrosion or other damage.
2. Check to insure batteries are correctly installed.
3. Following the installation instructions on Page 2 connect Odyssey to a good TV receiver. Check Channel Switch setting in Odyssey battery compartment. Insert Game Card No. 1 in the Master Control Unit.
4. If there is no player image on the television screen when a Game Card is inserted in the Master Control Unit:
 - a. Rotate the HORIZONTAL and VERTICAL controls on both Player Control Units. If the Player images do not appear on the screen, continue with the check list.
 - b. Check to see that the Channel Selector on television is set to the proper channel (3 or 4), as indicated by the Channel Switch in the Master Control Unit.
 - c. Check to see that the Game Card is inserted properly with the number facing outward and is plugged in all the way.
 - d. Check to see that the Antenna-Game Switch is in the "Game" position and that the Antenna-Game Switch has been properly installed.
 - e. Check to see that the Game Cord is plugged into the socket provided on the top of the Antenna-Game Switch and on the back of the Master Control Unit.
 - f. Connect an external +9 volt power supply to J1. If unit now functions normally, replace all batteries with new ones. Insure that batteries are properly installed.



- g. Check to insure that the contacts of J1 close when external power plug is removed. If J1 contacts do not press together, bend one or the other until contact is made. Recheck operation with external power supply. J1 is accessible through the battery compartment.
5. If trouble is experienced with one or more games:
 - a. Check to be sure the proper Game Card is properly inserted in the Master Control Unit.
 - b. Check Game Card to see if there is any visible damage to the card.
 - c. If no Players, Ball, or Wall appear on the television screen, try a new Game Card.
 - d. If one Player does not appear or cannot be controlled, or if control of Ball by that Player Control Unit is abnormal, unplug the Player Control Units and switch them. If malfunction changes to other side, a Player Control Unit is defective and should be replaced.
 - e. In the event the preceding steps fail to locate the problem, the Master Control Unit should be repaired or replaced.
 - f. If the Unit operates normally except with accessories, check accessory connections. Test the Unit with new accessory. If the malfunction disappears, original accessory is defective; if not, replace Master Control Unit.

"CIRCUIT MODULES" REPLACEMENT PARTS LIST
(Individual Parts with the Module are not available)

REF.	DESCRIPTION	PART NO.
	Horizontal Sync Generator Module Vertical Sync Generator Module (BLAK)	703491-3
	Vertical Sync Generator Module (BK12)	703492-3
	Player No. 1 Generator Module (BLAK)	703492-5
	Player No. 1 Generator Module (BK12)	703493-2
	Player No. 2 Generator Module (BLAK)	703493-3
	Player No. 2 Generator Module (BK12)	703493-2
	Ball Generator Module (BLAK)	703493-3

REF.	DESCRIPTION	PART NO.
	Ball Generator Module (BK12) Wall Generator Module (BLAK)	703493-3
	Wall Generator Module (BK12)	703493-2
	Flip-Flop/English Module	703493-3
	Flip-Flop/Ball Module	703494-2
	Gate Matrix Module (BLAK)	703494-2
	Gate Matrix Module (BK12)	703495-2
	Summer Module	703495-4
	RF Oscillator Module	703496-2
	RF Filter Module	703497-3
	Hand Control No. 1 & 2 Module (BLAK)	703498-2
	Hand Control No. 1 & 2 Module (BK12)	703488-2
		703488-3

701578-1 & 4 "PLAYER CONTROL" REPLACEMENT PARTS LIST

REF.	DESCRIPTION	PART NO.	REF.	DESCRIPTION	PART NO.
	Vertical Knob Horizontal Knob English Knob Reset Switch Knob Front Control Cover	142695-1 142696-1 142697-4 142828-1 142706-1	S1 R6A,B R8	Back Control Cover Feet, Black (4 used) Reset Switch 100K/25K, English/Horizontal 50K, Vertical	142705-1 141737-3 160487-1 220272-3 220281-1

"GAME BOX" REPLACEMENT PARTS LIST

REF.	DESCRIPTION	PART NO.	REF.	DESCRIPTION	PART NO.
	<u>TABLE TENNIS</u> Game Card Overlay (Medium) Overlay (Large) <u>SKI</u> Game Card Overlay (Medium) Overlay (Large) <u>HOCKEY</u> Game Card Overlay (Medium) Overlay (Large) Tape <u>FOOTBALL</u> Game Card Overlay (Medium) Overlay (Large) Marker & Score Card Board Cards <u>SUBMARINE</u> Game Card Overlay (Medium) Overlay (Large) <u>ROULETTE</u> Game Card Overlay (Medium) Overlay (Large) Chips	142888-1 151366-2 151367-2 142888-2 151366-5 151367-5 142888-3 151366-3 151367-3 642897-1 142888-4 151366-4 151367-4 642964-1 642898-1 701525-1 142888-5 151366-6 151367-6 142888-6 151366-11 151367-11 701528-1		<u>SIMON SAYS</u> Overlay (Medium) Overlay (Large) Cards <u>HAUNTED HOUSE</u> Overlay (Medium) Overlay (Large) <u>ANOLOGIC</u> Overlay (Medium) Overlay (Large) <u>CAT & MOUSE</u> Overlay (Medium) Overlay (Large) <u>STATES</u> Overlay (Medium) Overlay (Large) Map Cards Folder <u>MISCELLANEOUS</u> Operating Instruction Booklet Battery (6 used) Dice (2 used)	151366-8 151367-8 701527-1 151366-9 151367-9 151366-10 151367-10 151366-12 151367-12 151366-24 151367-24 591550-1 701526-1 591549-1 IB2622-3 530078-2 143018-1

703490-4 & 5 "MASTER" BOARD REPLACEMENT PARTS LIST

REF.	DESCRIPTION	PART NO.	REF.	DESCRIPTION	PART NO.
	<u>CAPACITORS</u> C1 Electrolytic, 220 mfd., 10V C2 Electrolytic, 47 mfd., 16V C3 Electrolytic, 10 mfd., 35V C4 Electrolytic, 47 mfd., 16V C5 Electrolytic, 10 mfd., 35V C6 Electrolytic, 100 mfd., 10V C7 Electrolytic, 10 mfd., 35V C8 Electrolytic, 4.7 mfd., 50V C9 Electrolytic, 10 mfd., 35V C10 Electrolytic, 4.7 mfd., 50V C12 Electrolytic, 100 mfd., 10V C14 Electrolytic, 470 mfd., 16V C15 Electrolytic, 470 mfd., 16V C21 Electrolytic, 47 mfd., 16V (BK12 only) <u>CONTROLS & SWITCHES</u> R3 9K, Ball Speed R4 15K, Ball Height R6 47K, Ball Width R12 25K, Wall Center Adjust R17 47K, Wall Width R26 47K, Player No. 1 Width R28 15K, Player No. 1 Height R31 15K, Player No. 2 Height R32 47K, Player No. 2 Width R38 47K, Horiz. Frequency Adjust R39 100K, Vertical Freq. Adjust S1 Channel Slide Switch <u>SEMICONDUCTORS</u> D2 Silicon Diode D3 Silicon Diode D4 Silicon Diode D5 Germanium Diode D6 Germanium Diode	270111-2210 270109-5115 270109-1135 270111-5115 270109-1135 270109-1210 270109-1135 270109-5050 270109-1135 270109-5050 270109-1210 270109-5215 270109-5215 270109-5115	D7 D8 D9 D10 Z1 Z1 Z2 Q1 Q2 Q3 SCR1	Germanium Diode Germanium Diode Silicon Diode (BK12 only) Silicon Diode (BK12 Only) Zener Diode (6.2V) (BLAK Only) Zener Diode (6.8V) (BK12 Only) Zener Diode (6.8V) (BLAK Only) NPN Silicon NPN Silicon NPN Silicon (BK12 Only) Thyristor <u>MISCELLANEOUS</u> FB1 thru 4 TM1 TM2 J1	530065-1002 530065-1002 530072-1018 530072-1018 530157-629 530157-689 530157-689 610142-9 610142-9 610142-9 611003-1 364005-1 230205-1 230205-2 701479-4 181096-1 181102-1 200451-2 181105-3

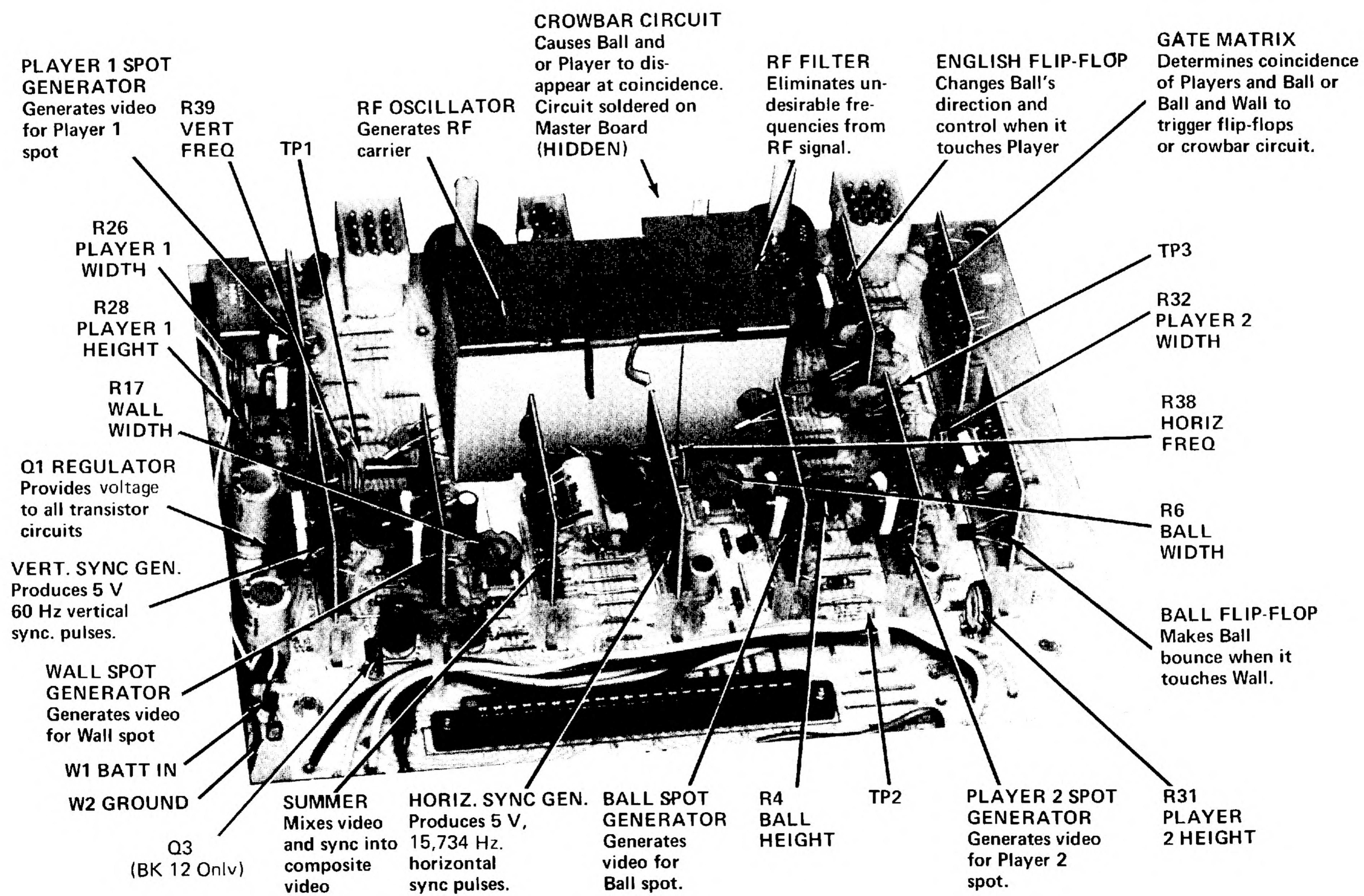






Figure 3 -- Master Board Module Location




1TL200 BLAK ODYSSEY SCHEMATIC DIAGRAM








1TL200BK12 ODYSSEY SCHEMATIC DIAGRAM





ODYSSEY TROUBLESHOOTING

This troubleshooting guide contains instructions for locating improper adjustments, or faulty modules. The symptoms are followed with the items most likely to be the cause. Figure 1 and Figure 3 may provide helpful information.

Before making any adjustments or changing modules, inspect the chassis to insure all modules are secure in their respective sockets and no mechanical damage is apparent. Connect Odyssey to a TV set using the complete installation procedure previously outlined. Insert Game Card No. 1 and measure the +5.6 VDC on BLAK versions, (+6.2 VDC on BK12 versions) regulated supply voltage at TP1. If the voltage at W1 is less than 7.5 Volts, replace the batteries.

The spot generator modules used for generation of Player 1, Player 2, Ball, and Wall are identical and may be interchanged as an aid to troubleshooting. Similarly the ball flip-flop and English flip-flop use the same module.

1. Player, Ball, or Wall is too wide or too narrow.

- a. Width control R26, R32, R6, or R17 is set improperly.
- b. Applicable spot generator module is defective.

2. Player or Ball is too short or too tall.

- a. Height control R28, R31, or R4 is set improperly.
- b. Applicable spot generator module is defective.

3. Display has vertical roll (may appear as multiple random spots on screen).

- a. Vertical frequency control R39 is set improperly.
- b. Vertical sync generator module is defective.

4. Display tears horizontally.

- a. Horizontal frequency control R38 is set improperly.
- b. Horizontal sync generator module is defective.

5. Player No. 1 does not appear on screen.

- a. R26 (Width) or R28 (Height) controls set too low.
- b. Player 1 spot generator module is defective.
- c. Q1 or SCR 1 in crowbar circuit is defective.

6. Player No. 2 does not appear on screen.

- a. R32 (Width) or R31 (Height) controls set too low.
- b. Player 2 spot generator module is defective.
- c. Q2 or SCR1 in crowbar circuit is defective.

7. Ball does not appear on screen.

- a. R6 (Width) or R4 (Height) controls set too low.

b. Ball spot generator module is defective.

c. English flip-flop module is defective.

d. Ball flip-flop module is defective.

e. Gate matrix module is defective.

f. Q2 or SCR1 in crowbar circuit is defective.

8. Wall does not appear on screen.

a. R17 Wall Width control is set too low.

b. Wall spot generator is defective.

9. No video appears on screen.

a. TV may be on wrong channel.

b. TV may be mistuned.

c. Antenna-Game Switch not in Game position.

d. Game Cord is open or shorted.

e. Antenna-Game Switch is defective.

f. Q1 voltage regulator is defective.

g. Horizontal sync generator module is defective.

h. Vertical sync generator module is defective.

i. Summer module is defective.

j. Master board containing RF circuits is defective.

NOTE: IF RF CIRCUITS ARE DEFECTIVE REPLACE THE MODULES AND RETURN TO FACTORY. ALSO WHEN REPLACING MODULES BE SURE TO RESOLDER THE RF SHIELD COVER.

10. Ball movement is erratic or drifts slowly.

a. English flip-flop module is defective.

b. Ball flip-flop module is defective.

c. Ball spot generator is defective.

11. Wall only appears on screen, no players or Ball.

a. Vertical sync generator is defective.

12. At coincidence, Player or Ball does not disappear.

a. Gate matrix is defective.

b. Q2 or SCR1 in crowbar circuit is defective.

13. Player is not moveable over entire face of TV screen.

a. Player Control Unit is defective.

b. Player spot generator module is defective.

General Description

The rifle is designed to be mounted into the M16A1 light support (lamps and viewing controls).

NOTE: If the rifle is brightened.

Sight Alignment

1. Set the rifle on a flat surface.

2. Plug the power cord into the receptacle.

3. Insert the battery pack into the rifle. A white cock towards the left. Light the vertical illuminator. The center dot will appear.

4. Stand the rifle upright and aim the sight.

5. Squeeze the trigger. Thus continue while.

6. If air bubbles form in the oil or cooling system.

7. If the gun is on the ground or of error.

8. Once a day or year of your TV set.

9. Aim the sight at the screen. Turn the control knobs until the sight is centered.

LDR Bias Adjustment

1. Detach the remote control from the receiver.

2. Replace the half cover.

3. Insure the receiver is tilted.

1TL950 RIFLE ACCESSORY SERVICING**General Description**

The rifle is sturdily constructed and is completely safe. It is designed to extinguish a light (or target) that appears on the TV screen when either Game Card 9 or 10 is inserted into the Master Control Unit. Since the rifle is sensitive to all light sources, it is important that the room lighting (lamps and sunlight) be adjusted to simulate normal light viewing conditions.

NOTE: If the rifle is aimed at a light source other than that which appears on the screen (such as a lamp or sun-brightened window), it will extinguish the target.

Sight Alignment

1. Set up your ODYSSEY unit as outlined in the **INSTALLATION** instructions.
2. Plug the rifle cord (P20) into the ACC (Accessory) receptacle on the back of the Master Control unit.
3. Insert Game Card 9 into the Master Control unit. If a white spot of light is not visible on the TV screen, cock the rifle by sliding the pump handle back towards the trigger and then releasing it. Should the light still not be visible, rotate the Player No. 2 Vertical and Horizontal controls until the light is in the center of the screen.
4. Stand approximately six feet from the TV screen and aim the rifle at the spot of light.
5. Squeeze the trigger, the spot of light should disappear. Thus the sights are okay. If the light does not disappear, continue cocking the rifle and pulling the trigger while moving closer to the screen.
6. If aim is off in elevation, turn the screw adjustment of the rear sight. (Rotate clockwise to lower muzzle or counterclockwise to raise muzzle).
7. If the aim is off in azimuth, loosen the clamp screw on the front sight and rotate the sight in the direction of error.
8. Once you have extinguished the light and are certain of your aim, return to a position of six feet from the TV screen and cock the rifle to reset the target.
9. Aim the rifle at each of the four corners of the screen and pull the trigger. If the target disappears, turn the brightness control of the TV down and the contrast control Up. This will lower the light level of the screen background and brighten the target.

LDR Bias Adjustment

1. Detach the left half of the stock of the rifle by removing the five screws holding the two halves together.
2. Replace the two screws through the barrel and right half of the stock to hold it while testing.
3. Insure that the barrel lens is in place, clean and not tilted.

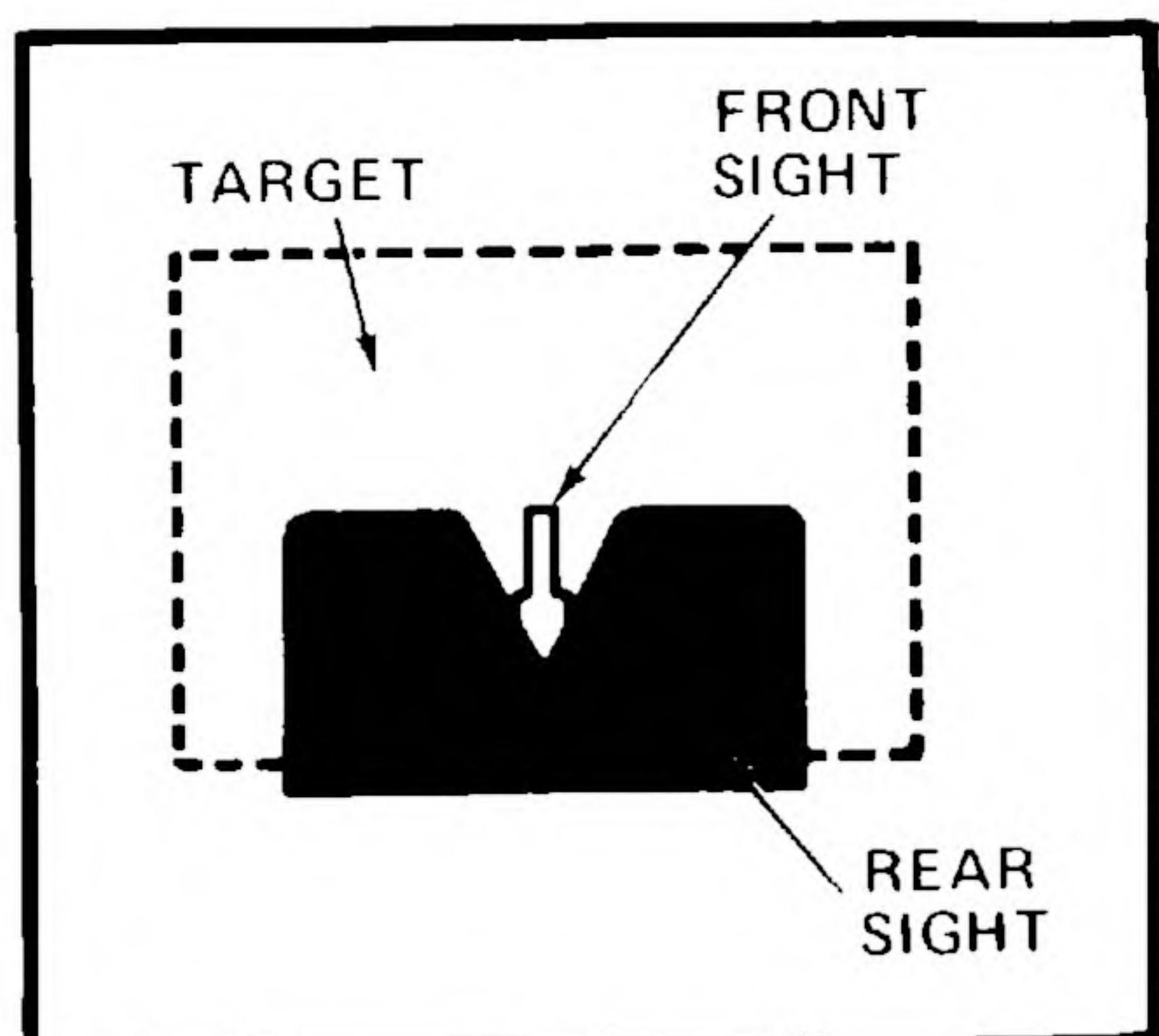
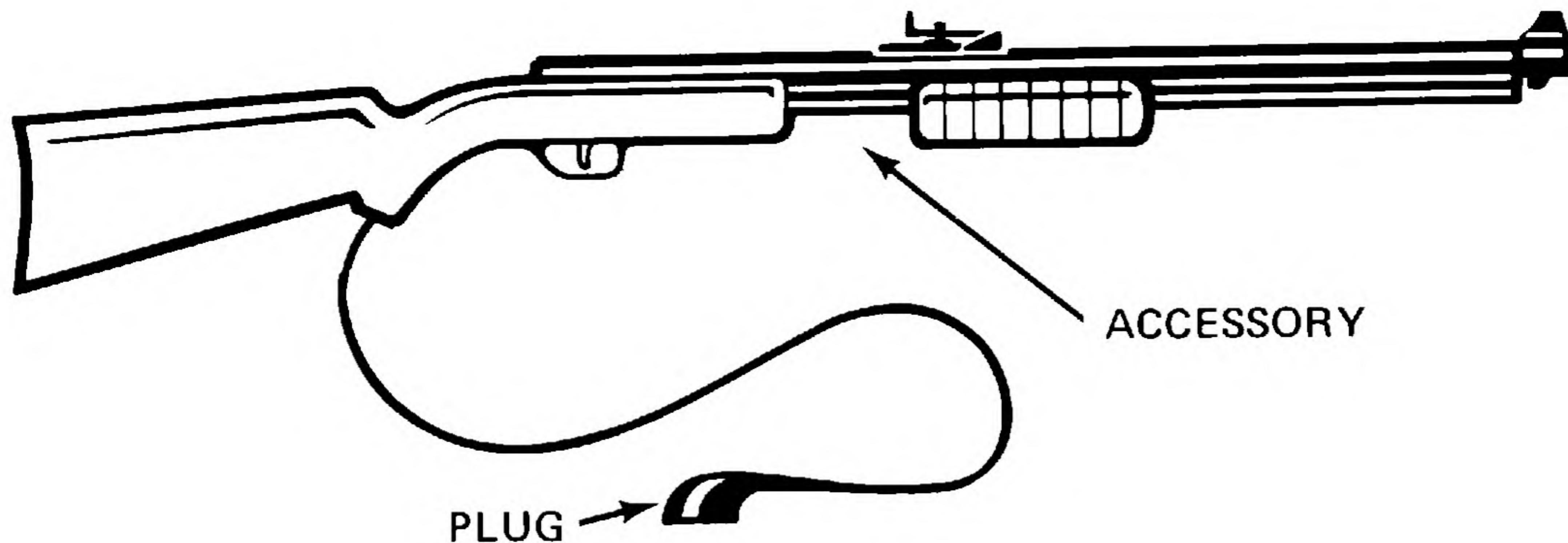
4. Plug the rifle cord (P20) into the ACC jack on the Master Control unit.
5. Insert Game Card 9 into the slot.
6. Locate Player No. 2 on the screen.
7. Rotate the brightness control of the TV until the background level is a natural gray.
8. Rotate the LDR Bias Adjust (R11) fully clockwise.
9. Aim the gun point blank at the gray area (not at the Spot) and pull the trigger. The Player No. 2 Spot should remain lit.
10. While pumping the trigger, slowly rotate (R11) counter-clockwise until Player No. 2 spot disappears. (Note: allow at least 2 seconds between triggering). If the spot never disappears at any setting of R11, replace the gun.
11. Press the Player No. 2 reset button.
12. Adjust the TV brightness and contrast controls for a white Player No. 2 spot on a dark background.
13. To check for correct LDR Bias adjustment, simulate ambient light surroundings.
14. Hold the gun six feet from the TV, aim at the background and pull the trigger. The spot should remain lit.
15. Carefully aim at the spot and pull the trigger. The spot now should disappear.

Rifle Troubleshooting

1. Target does not disappear when lit.
 - a. Check the lens in the end of the barrel for dirt or scratches.
 - b. Make sure lens is not tilted. (Replace lens if necessary).
 - c. Check accuracy of gun sights. (Adjust sights as required).
 - d. Perform LDR Bias adjustment.
 - e. Rifle is defective.
 - f. Master Control unit is defective.
2. Target disappears even when missed.
 - a. Correct setting of the brightness and contrast controls on TV. (Brightness turned down and Contrast Up).
 - b. Perform LDR Bias adjustment.
 - c. Rifle is defective.
 - d. Master Control unit is defective.

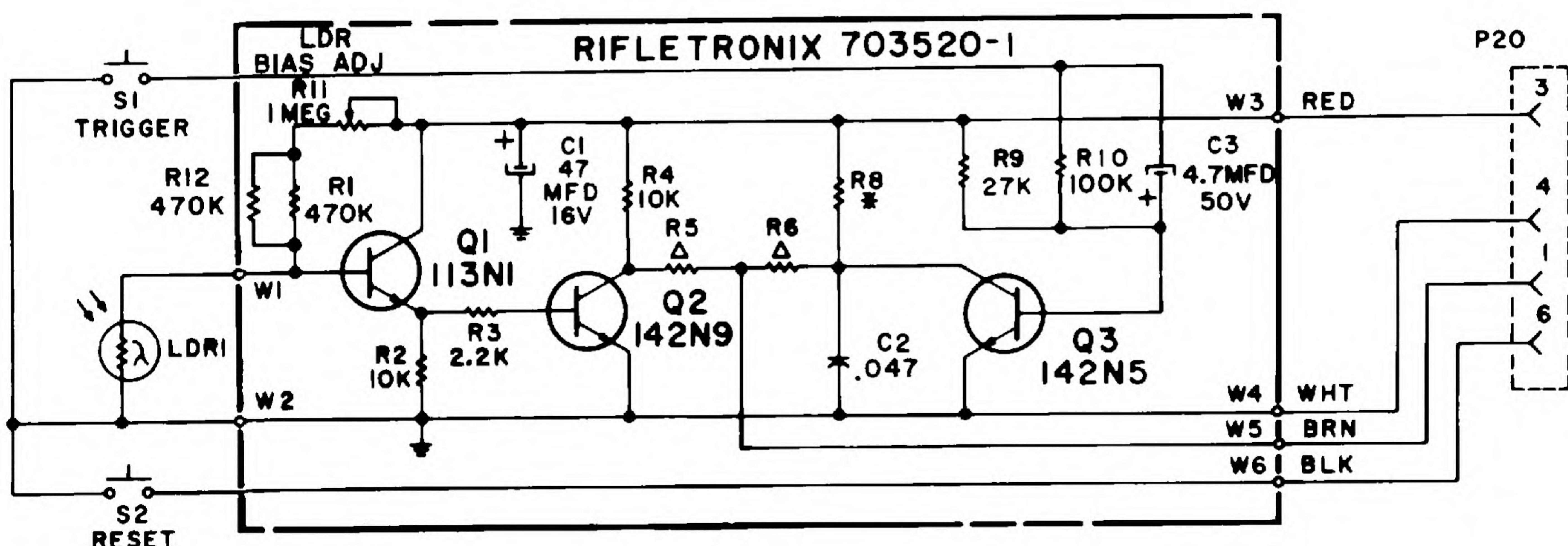
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C1
C2
C3R11
S1
S2



Rifle Sights

1TL950 RIFLE SCHEMATIC DIAGRAM



703520-1 "RIFLETRONIX BOARD" REPLACEMENT PARTS LIST

REF.	DESCRIPTION	PART NO.	REF.	DESCRIPTION	PART NO.
C1 C2 C3	CAPACITORS Electrolytic, 47 mfd., 16V Polyester, .047 mfd., 10%, 100V Electrolytic, 4.7 mfd., 50V	270109-5115 250581-4743 270109-5050	Q1 Q2 Q3	SEMICONDUCTORS NPN Silicon NPN Silicon NPN Silicon	610113-1 610142-9 610142-5
R11 S1 S2	CONTROLS & SWITCHES 1 meg., LDR Bias Adjust Trigger Switch Reset Switch	220193-36 731984-1 731985-1	LDR1	MISCELLANEOUS Light Dependent Resistor LDR Holder, Top LDR Holder, Bottom Wire Wrap Pin	230204-2 142722-1 142723-1 200460-3